

# PATENT ABSTRACTS OF JAPAN

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## (54) TOOTH POWDER COMPOSITION

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a tooth powder composition that can remove the precipitate and the plaque on tooth surface by the action of carbon dioxide foam and is excellent in prevention of tooth decay and periodontitis by using a carbon dioxide-generating substance and a surfactant in combination.

SOLUTION: This tooth powder composition contains (A) a carbonate (particularly calcium carbonate, sodium hydrogen carbonate, potassium hydrogen carbonate are suitable), (B) an acid (particularly ascorbic acid, malic acid, tartaric acid or citric acid are suitable) and (C) a surfactant (particularly an alkyl sulfate salt, monoalkyl sulfate ester salt or monoalkylphosphate is suitable). To this composition, may be added (D) an abrasive (as secondary calcium phosphate dihydrate) in addition. The formulation of this composition is (A) 0.5-40 wt.% based on the whole composition, (B) 10-40 wt.% based on (A), (C) 0.01-20 wt.%, based on the whole composition and (D) 5-80 wt.% in the whole composition. This composition can effectively distribute the formulated components as pharmaceutically effective components in the mouth cavity.

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**CLAIMS**

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[Claim(s)]

[Claim 1] (A) The powder toothbrushing constituent characterized by containing a carbonate, the (B) acid, and the (C) surfactant.

[Claim 2] Furthermore, the powder toothbrushing constituent containing the (D) abrasive material according to claim 1.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention can float and remove the precipitate and dental plaque which adhered on the surface of the gear tooth according to a foaming operation of carbon dioxide gas, and can spread a combination component over inner mouth efficiently, and relates to the powder toothbrushing constituent excellent in the preventive effect of a cavity or a periodontal disease.

[0002]

[Description of the Prior Art] A toothbrushing constituent is \*\*\*\*\* used for prevention of a cavity or a periodontal disease while cleaning a tooth and its periphery, purifying inner mouth and making it invigorating. That is, various precipitates exist in the oral cavity, especially the dental plaque that is a bacterial precipitate causes a cavity, a periodontal disease, and ozostomia, and if a dental plaque calcifies further, the dental calculus which adhered to the tooth firmly will be formed. Moreover, the colored nature precipitate originating in the food taken in every day makes the original color of a tooth lose, and becomes the cause which spoils a fine sight remarkably.

[0003] For this reason, the abrasive material and the foaming agent were blended with the conventional toothbrushing constituent, and the precipitate and dirt which adhered on the surface of the gear tooth according to these physical operations are removed to it using a gear-tooth brush. However, it is difficult the precipitate which the detailed impression which the hair ends of an abrasive material particle or a gear-tooth brush do not reach on the surface of a gear tooth existed, and adhered to the part, and to remove a dental plaque etc. thoroughly by an abrasive material etc.

[0004]

[Problem(s) to be Solved by the Invention] Therefore, the object of this invention can remove effectively the precipitate and dental plaque which adhered on the surface of the gear tooth, and is to offer the toothbrushing constituent excellent in the preventive effect of a cavity or a periodontal disease.

[0005]

[Means for Solving the Problem] In this actual condition, this invention persons floated effectively, and could remove the precipitate and dental plaque to which the powder toothbrushing constituent containing a carbonate, an acid, and a surfactant adhered on the surface of the gear tooth according to a foaming operation of carbon dioxide gas as a result of inquiring wholeheartedly, and the combination component could be efficiently spread over inner mouth, and a header and this invention were completed for excelling in the preventive effect of a cavity or a periodontal disease.

[0006] That is, the powder toothbrushing constituent characterized by this invention containing the (A) carbonate, the (B) acid, and the (C) surfactant is offered.

[0007]

[Embodiment of the Invention] As a carbonate of a component (A) used by this invention, for example, a sodium carbonate, a calcium carbonate, a sodium hydrogencarbonate, potassium carbonate, a potassium hydrogencarbonate, an ammonium carbonate, sodium sesquicarbonate, etc. are mentioned, and especially a calcium carbonate, a sodium hydrogencarbonate, and a potassium hydrogencarbonate are [ among these ] desirable.

[0008] As for these carbonates, it is desirable to be able to use combining one sort or two sorts or more, and to blend 0.5 to 40% of the weight during [ all ] a presentation, and two to 30% of the weight, since the balance of a flavor and fizz becomes good, it is especially desirable to blend further three to 20% of the weight.

[0009] As an acid of a component (B) used by this invention, organic acids, such as a citric acid, a tartaric acid, an ascorbic acid, a malic acid, a fumaric acid, a succinic acid, and a malonic acid, are mentioned, for example, and an ascorbic acid, a malic acid, a tartaric acid, and a citric acid are [ among these ] especially desirable.

[0010] As for these acids, it is desirable to be able to use combining one sort or two sorts or more, and to blend ten to 400% of the weight to the carbonate of a component (A), and it is desirable to blend further 30 to 100% of the weight 20 to 200% of the weight especially.

[0011] As a surfactant of a component (C) used by this invention It will not be restricted especially if blended with the usual toothbrushing constituent. For example, an alkyl-sulfuric-acid ester salt, alpha-sulfo aliphatic alkylester, or its water-soluble salt, Anionic surfactants, such as N-acylamino acid chloride, monoalkyl phosphate, or its water-soluble salt; A fatty-acid monoglyceride, Fatty acid alkanolamide, polyoxyethylene sorbitan fatty acid ester, Ethylene glycol fatty acid ester, polyoxyethylene fatty acid ester, Nonionic surfactants, such as polyoxyethylene hydrogenated castor oil, sucrose fatty acid ester, and the polyoxyethylene polypropylene ether; Carboxy betaine, Amphoteric surface active agents, such as phosphobetaine, sulfobetaine, and an imidazolium betaine; half-polarity surfactants, such as alkylamine oxide, etc. are mentioned. An alkyl-sulfuric-acid ester salt, monoalkyl phosphate, polyoxyethylene hydrogenated castor oil, and the polyoxyethylene polypropylene ether are [ among these ] especially desirable.

[0012] As for these surfactants, it is desirable to be able to blend combining one sort or two sorts or more, and to blend 0.01 to 20% of the weight during [ all ] a presentation, and it is desirable to blend further 0.5 to 5% of the weight 0.1 to 10% of the weight especially.

[0013] Since the dental plaque which could blend the abrasive material with the powder toothbrushing

constituent of this invention as a component (D) further, and floated by foaming of carbon dioxide gas is efficiently removable, it is desirable. As this abrasive material, two hydrates of dibasic calcium phosphate and an anhydride, the 1st calcium phosphate, tribasic calcium phosphate, a calcium carbonate, pyrophosphoric-acid calcium, an oxidation alumina, an aluminum hydroxide, an alumina, a silicic acid anhydride, a silica, silica gel, aluminosilicate, an aluminum silicate, insoluble sodium metaphosphate, the 3rd magnesium phosphate, a calcium sulfate, a bentonite, zirconium silicate, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more. Especially when blending these abrasive materials, it is desirable to blend ten to 60% of the weight five to 80% of the weight during [ all ] a presentation.

[0014] The component used for the usual toothbrushing constituent besides said component, for example, an extending agent, a sweetening agent, preservatives, a germicide, a drug effect component, pH regulator, a binder, a pigment, coloring matter, perfume, etc. can be suitably blended with the powder toothbrushing constituent of this invention in the range which does not spoil the effectiveness of this invention.

[0015] As an extending agent or a sweetening agent, a polyethylene glycol, a sorbitol, maltitol, xylitol, the Lactyl toll, saccharin, saccharin sodium, stevioside, a mannitol, a fructo oligosaccharide, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more.

[0016] As preservatives, p-hydroxymethyl benzoate, p-hydroxyethyl benzoate, p-hydroxypropyl benzoate, sodium benzoate, lower-fatty-acid monoglyceride, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more.

[0017] As a germicide and a drug effect component, for example Enzymes, such as a dextranase and an amylase, Alkali-metal mono-fluoro phosphate, such as mono-fluorophosphoric acid sodium and a mono-fluorophosphoric acid potassium, A sodium fluoride, tranexamic acid and epsilon-aminocaproic acid, Aluminum KURORU hydroxy allantoin, allantoin, a dihydrocholesterol, Glycyrrhizic acid salts, glycyrrhetic acid, glycerophosphate, Glucose phosphate, chlorophyll, a sodium chloride, benzethonium chloride, chlorhexidine salts, cetylpyridinium chloride, a benzalkonium chloride, etc. are mentioned, and these can be blended combining one sort or two sorts or more.

[0018] Furthermore, as a pH regulator, a sodium hydrogencarbonate, sodium dihydrogen phosphate, phosphoric-acid hydrogen disodium, a sodium carbonate, potassium carbonate, a sodium hydroxide, a potassium hydroxide, an arginine, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more.

[0019] As a binder, carboxymethylcellulose sodium, hydroxyethyl cellulose, xanthan gum, a carrageenan, a carboxyvinyl polymer, polyvinyl alcohol, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more.

[0020] The powder toothbrushing constituent of this invention is a powdery thing which can manufacture said component by mixing to homogeneity according to a conventional method, and does not contain water substantially.

[0021]

[Effect of the Invention] The powder toothbrushing constituent of this invention is not a physical operation of the conventional abrasive material, according to a foaming operation of the carbon dioxide gas by the carbonate and the acid, it can float effectively, and can remove the precipitate and dental plaque which adhered on the surface of the gear tooth, and can spread combination components, such as a drug effect component, over inner mouth efficiently, and is excellent in the preventive effect of a cavity or a periodontal disease.

[0022]

[Example] Next, although an example is given and this invention is explained further, this invention is

not limited to these examples.

[0023] The component shown in one or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 1]

(Component) (% of the weight)

An ascorbic acid 10.0 Polyethylene glycol 6000 4.0 Mono-fluorophosphoric acid sodium 0.6 Dibasic-calcium-phosphate anhydride 20.0 Sodium hydrogencarbonate 5.0 Maltitol 54.1 Saccharin sodium 0.3 Sodium lauryl sulfate 2.0 Silicic acid anhydride 3.0 Perfume (grapefruit type) 1.0 Sum total 100.0

[0024] The component shown in two or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 2]

(Component) (% of the weight)

Sodium ascorbate 10.0 Aluminum hydroxide 20.0 Sodium hydrogencarbonate 5.0 Citric acid 10.0 Maltitol 48.8 Saccharin sodium 0.4 Sodium lauryl sulfate 2.0 Silicic acid anhydride 3.0 Perfume (spearmint type) 0.8 Sum total 100.0 [0025] The component shown in three or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 3]

(Component) (% of the weight)

A citric acid 15.0 Mono-fluorophosphoric acid sodium 0.6 Calcium carbonate 30.0 Xylitol 48.6 Saccharin sodium 0.3 Sodium lauryl sulfate 1.0 Polyoxyethylene hydrogenated castor oil 1.0 Silicic acid anhydride 3.0 Perfume (peppermint type) 0.5 Sum total 100.0 [0026] The component shown in four or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 4]

(Component) (% of the weight)

A tartaric acid 15.0 Mono-fluorophosphoric acid sodium 0.6 Silicic acid anhydride 20.0 Sorbitol 51.0 Saccharin sodium 0.4 mono-millimeter still phosphate 0.5 Sodium lauryl sulfate 1.5 Sodium hydrogencarbonate 10.0 Perfume (grapefruit type) 1.0 Sum total 100.0 [0027] The component shown in five or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 5]

(Component) (% of the weight)

An ascorbic acid 20.0 Polyethylene glycol 6000 10.0 Dibasic-calcium-phosphate anhydride 20.0 Sodium hydrogencarbonate 10.0 Maltitol 33.7 Saccharin sodium 0.5 Sodium lauryl sulfate 2.0 Silicic acid anhydride 3.0 Perfume (spearmint type) 0.8 Sum total 100.0 [0028] In example of comparison 1 example 1, powder toothbrushing was manufactured like the example 1 except having removed the ascorbic acid.

[0029] In example of comparison 2 example 2, powder toothbrushing was manufactured like the example 2 except having removed the sodium hydrogencarbonate.

[0030] In example of comparison 3 example 3, powder toothbrushing was manufactured like the example 3 except having removed the citric acid.

[0031] In example of comparison 4 example 4, powder toothbrushing was manufactured like the example 4 except having removed the malic acid.

[0032] In example of comparison 5 example 5, powder toothbrushing was manufactured like the example 5 except having removed the ascorbic acid.

[0033] The component shown in six or less example of a comparison was mixed to homogeneity, and kneading toothbrushing was manufactured.

[A table 6]

(Component) (% of the weight)

Sodium ascorbate 10.0 Polyethylene glycol 400 4.0 Dibasic calcium phosphate 35.0 Mono-fluorophosphoric acid sodium 0.6 Glycerol 15.0 Saccharin sodium 0.3 Sodium lauryl sulfate 2.0 Carboxymethylcellulose sodium 1.0 Perfume (spearmint type) 1.0 Ion exchange water Balance Sum total 100.0 [0034] About toothbrushing obtained in example of trial 1 examples 1-5, and the examples 1-6 of a comparison, the foam formation force and a dental plaque elimination factor were evaluated by the following approaches. A result is shown in a table 7.

[0035] (1) Foam formation force : 90g of ion exchange water was added to toothbrushing sample 30g, and suspension was prepared. The amount of foam formation (ml) after performing reversal stirring and putting this suspension for 30 seconds after stirring termination at 36 degrees C for 3 minutes using a reversal stirring type foam formation force testing machine (made in Arp) was measured.

[0036] (2) dental plaque elimination factor: -- first -- anterior-tooth gear-tooth Mabe, a test subject (N= 5), -- HABURASHI -- 30 strokes and SUKURAPPINGU -- it polished by law. subsequently, the disclosing solution (pro spec., GC dentistry industrial company make) dyed, and gear-tooth Mabe was photoed with the mono-zoom camera (x40 time) after that \*\* being right. 0.5g of then, toothbrushing -- HABURASHI -- attaching -- 30 strokes and SUKURAPPINGU -- it polished by law. the moisture of a tooth flank was dried by the air gun after that \*\* being right with water, and gear-tooth Mabe was photoed with the mono-zoom camera. Image analysis of the photoed image was carried out, the dental plaque residual area after polishing before polishing by toothbrushing was measured, and it asked for the dental plaque elimination factor (%). The average of the number of test subjects (N= 5) showed the dental plaque elimination factor.

[0037]

[A table 7].

[0038] The result of a table 7 showed that powder toothbrushing of this invention showed the high engine performance about the amount of foam formation, and a dental plaque elimination factor.

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## TECHNICAL FIELD

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[Field of the Invention] This invention can float and remove the precipitate and dental plaque which adhered on the surface of the gear tooth according to a foaming operation of carbon dioxide gas, and can spread a combination component over inner mouth efficiently, and relates to the powder toothbrushing constituent excellent in the preventive effect of a cavity or a periodontal disease.

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## PRIOR ART

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[Description of the Prior Art] A toothbrushing constituent is \*\*\*\*\* used for prevention of a cavity or a periodontal disease while cleaning a tooth and its periphery, purifying inner mouth and making it invigorating. That is, various precipitates exist in the oral cavity, especially the dental plaque that is a bacterial precipitate causes a cavity, a periodontal disease, and ozostomia, and if a dental plaque calcifies further, the dental calculus which adhered to the tooth firmly will be formed. Moreover, the colored nature precipitate originating in the food taken in every day makes the original color of a tooth lose, and becomes the cause which spoils a fine sight remarkably.

[0003] For this reason, the abrasive material and the foaming agent were blended with the conventional toothbrushing constituent, and the precipitate and dirt which adhered on the surface of the gear tooth according to these physical operations are removed to it using a gear-tooth brush. However, it is difficult the precipitate which the detailed impression which the hair ends of an abrasive material particle or a gear-tooth brush do not reach on the surface of a gear tooth existed, and adhered to the part, and to remove a dental plaque etc. thoroughly by an abrasive material etc.

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## EFFECT OF THE INVENTION

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[Effect of the Invention] The powder toothbrushing constituent of this invention is not a physical operation of the conventional abrasive material, according to a foaming operation of the carbon dioxide gas by the carbonate and the acid, it can float effectively, and can remove the precipitate and dental plaque which adhered on the surface of the gear tooth, and can spread combination components, such as a drug effect component, over inner mouth efficiently, and is excellent in the preventive effect of a cavity or a periodontal disease.

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] Therefore, the object of this invention can remove effectively the precipitate and dental plaque which adhered on the surface of the gear tooth, and is to offer the toothbrushing constituent excellent in the preventive effect of a cavity or a periodontal disease.

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## MEANS

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[Means for Solving the Problem] In this actual condition, this invention persons floated effectively, and could remove the precipitate and dental plaque to which the powder toothbrushing constituent containing a carbonate, an acid, and a surfactant adhered on the surface of the gear tooth according to a foaming operation of carbon dioxide gas as a result of inquiring wholeheartedly, and the combination component could be efficiently spread over inner mouth, and a header and this invention were completed for excelling in the preventive effect of a cavity or a periodontal disease.

[0006] That is, the powder toothbrushing constituent characterized by this invention containing the (A) carbonate, the (B) acid, and the (C) surfactant is offered.

[0007]

[Embodiment of the Invention] As a carbonate of a component (A) used by this invention, for example, a sodium carbonate, a calcium carbonate, a sodium hydrogencarbonate, potassium carbonate, a potassium hydrogencarbonate, an ammonium carbonate, sodium sesquicarbonate, etc. are mentioned, and especially a calcium carbonate, a sodium hydrogencarbonate, and a potassium hydrogencarbonate are [ among these ] desirable.

[0008] As for these carbonates, it is desirable to be able to use combining one sort or two sorts or more, and to blend 0.5 to 40% of the weight during [ all ] a presentation, and two to 30% of the weight, since the balance of a flavor and fizz becomes good, it is especially desirable to blend further three to 20% of the weight.

[0009] As an acid of a component (B) used by this invention, organic acids, such as a citric acid, a tartaric acid, an ascorbic acid, a malic acid, a fumaric acid, a succinic acid, and a malonic acid, are mentioned, for example, and an ascorbic acid, a malic acid, a tartaric acid, and a citric acid are [ among these ] especially desirable.

[0010] As for these acids, it is desirable to be able to use combining one sort or two sorts or more, and to blend ten to 400% of the weight to the carbonate of a component (A), and it is desirable to blend further 30 to 100% of the weight 20 to 200% of the weight especially.

[0011] As a surfactant of a component (C) used by this invention It will not be restricted especially if blended with the usual toothbrushing constituent. For example, an alkyl-sulfuric-acid ester salt, alpha-sulfo aliphatic alkylester, or its water-soluble salt, Anionic surfactants, such as N-acylamino acid chloride, monoalkyl phosphate, or its water-soluble salt; A fatty-acid monoglyceride, Fatty acid alkanolamide, polyoxyethylene sorbitan fatty acid ester, Ethylene glycol fatty acid ester, polyoxyethylene fatty acid ester, Nonionic surfactants, such as polyoxyethylene hydrogenated castor oil, sucrose fatty acid ester, and the polyoxyethylene polypropylene ether; Carboxy betaine, Amphoteric surface active agents, such as phosphobetaine, sulfobetaine, and an imidazolium betaine; half-polarity surfactants, such as alkylamine oxide, etc. are mentioned. An alkyl-sulfuric-acid ester salt, monoalkyl phosphate, polyoxyethylene hydrogenated castor oil, and the polyoxyethylene polypropylene ether are [ among these ] especially desirable.

[0012] As for these surfactants, it is desirable to be able to blend combining one sort or two sorts or more, and to blend 0.01 to 20% of the weight during [ all ] a presentation, and it is desirable to blend further 0.5 to 5% of the weight 0.1 to 10% of the weight especially.

[0013] Since the dental plaque which could blend the abrasive material with the powder toothbrushing constituent of this invention as a component (D) further, and floated by foaming of carbon dioxide gas is efficiently removable, it is desirable. As this abrasive material, two hydrates of dibasic calcium phosphate and an anhydride, the 1st calcium phosphate, tribasic calcium phosphate, a calcium carbonate, pyrophosphoric-acid calcium, an oxidation alumina, an aluminum hydroxide, an alumina, a silicic acid anhydride, a silica, silica gel, aluminosilicate, an aluminum silicate, insoluble sodium metaphosphate, the 3rd magnesium phosphate, a calcium sulfate, a bentonite, zirconium silicate, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more. Especially when blending these abrasive materials, it is desirable to blend ten to 60% of the weight five to 80% of the weight during [ all ] a presentation.

[0014] The component used for the usual toothbrushing constituent besides said component, for example, an extending agent, a sweetening agent, preservatives, a germicide, a drug effect component, pH regulator, a binder, a pigment, coloring matter, perfume, etc. can be suitably blended with the powder toothbrushing constituent of this invention in the range which does not spoil the effectiveness of this invention.

[0015] As an extending agent or a sweetening agent, a polyethylene glycol, a sorbitol, maltitol, xylitol,



the Lactitol, saccharin, saccharin sodium, stevioside, a mannitol, a fructo oligosaccharide, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more.

[0016] As preservatives, p-hydroxymethyl benzoate, p-hydroxyethyl benzoate, p-hydroxypropyl benzoate, sodium benzoate, lower-fatty-acid monoglyceride, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more.

[0017] As a germicide and a drug effect component, for example Enzymes, such as a dextranase and an amylase, Alkali-metal mono-fluoro phosphate, such as mono-fluorophosphoric acid sodium and a mono-fluorophosphoric acid potassium, A sodium fluoride, tranexamic acid and epsilon-aminocaproic acid, Aluminum KURORU hydroxy allantoin, allantoin, a dihydrocholesterol, Glycyrrhizic acid salts, glycyrrhetic acid, glycerol phosphate, Glucose phosphate, chlorophyll, a sodium chloride, benzethonium chloride, chlorhexidine salts, cetylpyridinium chloride, a benzalkonium chloride, etc. are mentioned, and these can be blended combining one sort or two sorts or more.

[0018] Furthermore, as a pH regulator, a sodium hydrogencarbonate, sodium dihydrogen phosphate, phosphoric-acid hydrogen disodium, a sodium carbonate, potassium carbonate, a sodium hydroxide, a potassium hydroxide, an arginine, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more.

[0019] As a binder, carboxymethylcellulose sodium, hydroxyethyl cellulose, xanthan gum, a carrageenan, a carboxyvinyl polymer, polyvinyl alcohol, etc. are mentioned, for example, and these can be blended combining one sort or two sorts or more.

[0020] The powder toothbrushing constituent of this invention is a powdery thing which can manufacture said component by mixing to homogeneity according to a conventional method, and does not contain water substantially.

---

## EXAMPLE

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[Example] Next, although an example is given and this invention is explained further, this invention is not limited to these examples.

[0023] The component shown in one or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 1]

(Component) (% of the weight)

An ascorbic acid 10.0 Polyethylene glycol 6000 4.0 Mono-fluorophosphoric acid sodium 0.6 Dibasic-calcium-phosphate anhydride 20.0 Sodium hydrogencarbonate 5.0 Maltitol 54.1 Saccharin sodium 0.3 Sodium lauryl sulfate 2.0 Silicic acid anhydride 3.0 Perfume (grapefruit type) 1.0 Sum total 100.0

[0024] The component shown in two or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 2]

(Component) (% of the weight)

Sodium ascorbate 10.0 Aluminum hydroxide 20.0 Sodium hydrogencarbonate 5.0 Citric acid 10.0 Maltitol 48.8 Saccharin sodium 0.4 Sodium lauryl sulfate 2.0 Silicic acid anhydride 3.0 Perfume (spearmint type) 0.8 Sum total 100.0

[0025] The component shown in three or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 3]

(Component) (% of the weight)

A citric acid 15.0 Mono-fluorophosphoric acid sodium 0.6 Calcium carbonate 30.0 Xylitol 48.6 Saccharin sodium 0.3 Sodium lauryl sulfate 1.0 Polyoxyethylene hydrogenated castor oil 1.0 Silicic acid anhydride 3.0 Perfume (peppermint type) 0.5 Sum total 100.0 [0026] The component shown in four or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 4]

(Component) (% of the weight)

A tartaric acid 15.0 Mono-fluorophosphoric acid sodium 0.6 Silicic acid anhydride 20.0 Sorbitol 51.0 Saccharin sodium 0.4 mono-millimeter still phosphate 0.5 Sodium lauryl sulfate 1.5 Sodium hydrogencarbonate 10.0 Perfume (grapefruit type) 1.0 Sum total 100.0 [0027] The component shown in five or less example was mixed to homogeneity, and powder toothbrushing was manufactured.

[A table 5]

(Component) (% of the weight)

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[0029] In example of comparison 2 example 2, powder toothbrushing was manufactured like the example 2 except having removed the sodium hydrogencarbonate.

[0030] In example of comparison 3 example 3, powder toothbrushing was manufactured like the example 3 except having removed the citric acid.

[0031] In example of comparison 4 example 4, powder toothbrushing was manufactured like the example 4 except having removed the malic acid.

[0032] In example of comparison 5 example 5, powder toothbrushing was manufactured like the example 5 except having removed the ascorbic acid.

[0033] The component shown in six or less example of a comparison was mixed to homogeneity, and kneading toothbrushing was manufactured.

[A table 6]

(Component) (% of the weight)

Sodium ascorbate 10.0 Polyethylene glycol 400 4.0 Dibasic calcium phosphate 35.0 Mono-fluorophosphoric acid sodium 0.6 Glycerol 15.0 Saccharin sodium 0.3 Sodium lauryl sulfate 2.0 Carboxymethylcellulose sodium 1.0 Perfume (spearmint type) 1.0 Ion exchange water Balance Sum total 100.0 [0034] About toothbrushing obtained in example of trial 1 examples 1-5, and the examples 1-6 of a comparison, the foam formation force and a dental plaque elimination factor were evaluated by the following approaches. A result is shown in a table 7.

[0035] (1) Foam formation force : 90g of ion exchange water was added to toothbrushing sample 30g, and suspension was prepared. The amount of foam formation (ml) after performing reversal stirring and putting this suspension for 30 seconds after stirring termination at 36 degrees C for 3 minutes using a reversal stirring type foam formation force testing machine (made in Arp) was measured.

[0036] (2) dental plaque elimination factor: -- first -- anterior-tooth gear-tooth Mabe, a test subject (N=5), -- HABURASHI -- 30 strokes and SUKURAPPINGU -- it polished by law. subsequently, the disclosing solution (pro spec., GC dentistry industrial company make) dyed, and gear-tooth Mabe was photoed with the mono-zoom camera (x40 time) after that \*\* being right. 0.5g of then, toothbrushing -- HABURASHI -- attaching -- 30 strokes and SUKURAPPINGU -- it polished by law. the moisture of a tooth flank was dried by the air gun after that \*\* being right with water, and gear-tooth Mabe was photoed with the mono-zoom camera. Image analysis of the photoed image was carried out, the dental

plaque residual area after polishing before polishing by toothbrushing was measured, and it asked for the dental plaque elimination factor (%). The average of the number of test subjects (N= 5) showed the dental plaque elimination factor.

[0037]

[A table 7]

[0038] The result of a table 7 showed that powder toothbrushing of this invention showed the high engine performance about the amount of foam formation, and a dental plaque elimination factor.